M

Gypsy Moth Manual

Appendix M

Nozzles and Pressures

Contents

Introduction

Nozzles, either fixed or rotary atomizer type, are used to atomize the insecticide into the desired droplet size.

Make sure that the end nozzle is no more than three-quarters of the wing span. If the boom extends 6 inches or more beyond the last nozzle, feed that nozzle from the end of the boom with a bleed line. See the figure on the following page.

Do not accept nozzles that do not produce the desired droplet sizes. Excessively large droplets waste insecticide, may cause burning of tender foliage, or leave harmful residues. Spray droplets that are too small may drift, contaminate food or feed crops in adjacent areas, and possibly damage the environment.

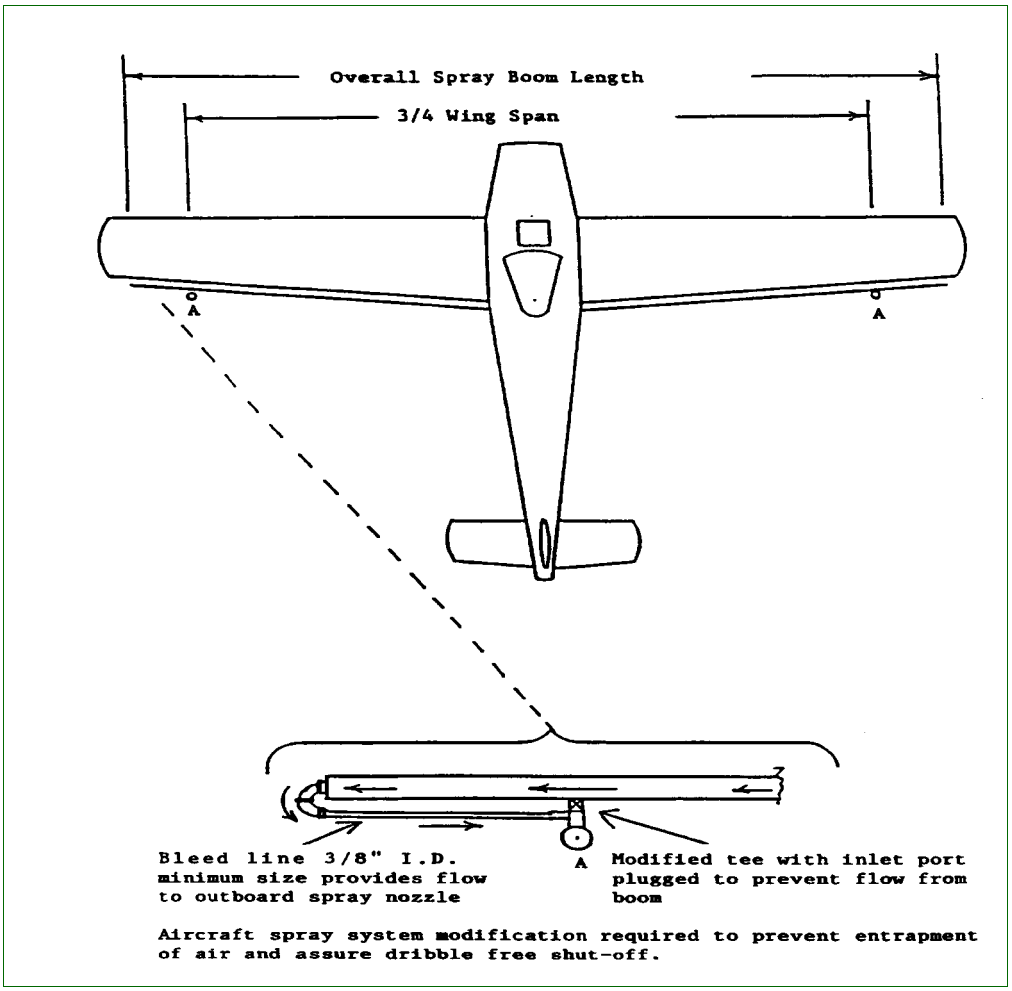

FIGURE M-1: Diagram of spray boom flow through bleed line to outermost nozzles

Flat Fan (Stainless Steel)

When flat fan nozzles are used, the spray contract should specify stainless steel nozzles. Do **not** allow the use of brass nozzle tips.

Two types of flat fan spray tips are used on gypsy moth programs. The tapered edge flat fan (8004) and the even flat fan (8004E). The tapered edge spray tip produces a pattern with heavier spray in the center and tapering to the edge. The even spray tip produces a uniform spray pattern from edge to edge. Both types are approved for use on APHIS programs.

Flat fan spray tips are categorized by the angle of the spray pattern and the flow rate when spraying water at 40 pounds per square inch. The angle of the spray pattern can vary according to the design of the nozzle, boom pressure, and surface tension of the spray material.

The desired droplet size can be obtained by orienting the spray nozzle from 45 degrees into the wind to 180 degrees trailing.

Example of spray nozzles are the following:

- Spraying Systems Company—TeeJet 8002 (flat spray tip)
  - 80—80° fan angle
  - 02—0.2 gallon per minute flow rate
- Spraying Systems Company—TeeJet 8003E (even flat spray tip)
  - 80—80° fan angle
  - 03—0.3 gallon per minute flow rate
  - E—even flat spray tip
- Delavan Corporation—LF-2-80 degree (flat fan spray tip)
  - LF—Flat spray tip
  - 2—0.2 gallon per minute flow
  - 80—80° fan angle
- Delavan Corporation—LE-3-80 degree (even flat spray tip)
  - LE—even flat spray tip
  - 3—0.3 gallon per minute flow
  - 80—80° fan angle

Rotary Atomizer Nozzles

Rotary atomizers are driven by wind, hydraulic, or electrical power. The spray material is delivered to the center of the unit and dispensed by centrifugal force. Droplet sizes are changed by rotating the device faster to decrease droplet size and slower to increase droplet size. Rotation speed is controlled by adjusting the pitch of the drive propeller or by changing the speed of the electric motor.

The Micronair Mini Atomizer is an example of the rotary atomizer that is capable of 2,000 to 12,000 revolutions per minute. By adjusting the fan blade, the rotational speed is changed and droplet size can be adjusted from 80 to 1,000 microns.

Spray Tip Wear

As spray tips are used, abrasion and erosion will increase the nozzle flow rate. Replace spray tips when a calibration check indicates a 5 percent flow rate increase. Most spray tip orifices are available in more than one material. The use of spray tips made of abrasive-resistant material, such as stainless steel, will provide long wear life.

Screens

Filter screens prevent foreign materials from entering and damaging precision parts of the system. These screens also prevent nozzle spray tips from clogging. Unless otherwise specified by the pesticide manufacturer, each spray system should be equipped with a 50 mesh in- line screen between the pump and boom and nozzle screens as recommended by the nozzle manufacturer.

Check and clean screens often to prevent misapplication of pesticides.